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chemical and crystallographic standpoint. His paper is particularly interesting as a résumé of our knowledge in regard to these two minerals.—In the same way F. Sansoni proposes to study calcite. He begins his work with an exhaustive paper of fifty-six pages on the crystals from Andreasburg.¹ He divides these into eight groups, according to their development, and then studies each group separately. Tables giving the frequency with which the 131 forms actually observed occur, and the combinations in which they are found, make up a considerable part of the article.

MISCELLANEOUS.—A chemical examination of nocerite² from Samo-Nocera leads E. Fischer to consider it a mixed fluoride and oxide with the composition $2(\text{Ca Mg})\text{F}_2 + (\text{Ca Mg})\text{O}$.—In an article on the Thuringian minerals, Luedecke³ describes crystals of orthite, from near Schmiedefeld, with the two new planes $5\text{P}\overline{\infty}$ and $\infty\text{P}\overline{10}$, others from a granitite near Brotterode with $\frac{7}{8}\text{P}\overline{\infty}$, and tiny brown anatase crystals on small quartz crystals in the lithophyses of a quartz porphyry from Brand, Thüringer Wald.

BOTANY.⁴

THE ASA GRAY VASE.—During the meeting of the American Association for the Advancement of Science, at Ann Arbor, in August last, the presence of so many botanists, and especially their frequent club meetings, suggested to the editors of the *Botanical Gazette* the possibility of some concerted action on the part of the botanists of the country to commemorate Dr. Asa Gray's seventy-fifth birthday anniversary. After some informal consultation, the matter was left in the hands of the originators to be managed as they thought best. Accordingly, notices were sent to as many American botanists as it was possible to reach in the short time at the disposal of the committee. The responses were most gratifying, and enabled the committee to select a design of a vase by L. E. Jenks, of Boston. The vase is solid silver, eleven inches in height, and stands upon a silver-hooped ebony pedestal. The ornamentation is very properly entirely botanical, and consists of plants in some way associated with Dr. Gray's work, or which are distinctively American. In the center of one side is *Grayia polygaloides*, on the other *Shortia galacifolia*. The following species are represented in the surrounding figures, viz: *Adlumia cirrhosa*, *Rudbeckia speciosa*, *Centaurea americana*, *Aquilegia canadensis*, *Aster bigelovii*, *Solidago serotina*, *Notholæna grayi*, *Lilium grayi*, *Dionæa muscipula*, *Jeffersonia diphylla*, *Mitchella repens*, *Epigæa repens*. The beauty of design and finish, as

¹ Zeitschrift für Krystallographie, x, p. 545.

² Zeitschrift für Krystallographie, x, p. 271.

³ *Ib.*, x, p. 187.

⁴ Edited by Professor CHARLES E. BESSEY, Lincoln, Nebraska.

well as the botanical accuracy of the work, have been much admired. Upon the hoop of the pedestal the following legend is engraved :

1810—November eighteenth—1885.

ASA GRAY,

In token of the universal esteem of American botanists.

The vase, accompanied with the cards of one hundred and eighty botanists, was presented without formality on Wednesday morning, the 18th of November.

It is a very pleasant duty to record in the *NATURALIST* the consummation of such a fitting plan of showing the esteem in which the name of Asa Gray is held by the botanists of America. That the days of the genial doctor among us may be prolonged for many years is the fervent prayer of every botanist.

CATALOGUE OF THE PLANTS OF NORTH AMERICA.—Every botanist who has charge of a considerable collection of plants has felt the need of a convenient check-list of North American plants. The old Gray Catalogue, which was followed by the Mann Catalogue, both confined to the plants included in Gray's Manual, and later, the more extended list compiled by A. H. Curtiss, served a good purpose. These, however, included a comparatively small part of the species of the whole continent, and the botanist who added Western species to his collection was left without the means for noting his accessions. This want is now supplied (in part, at least) by the Catalogue of the Phænogamous and Vascular Cryptogamous plants of North America (north of Mexico) compiled by J. H. Oyster, of Paola, Kansas. It contains entries of 9867 species. The arrangement of Choripetalæ and Gamopetalæ conforms very nearly with that of Bentham and Hooker's Genera Plantarum. For some unexplained reason the arrangement of Apetalæ and the Monocotyledons is not that of the Genera Plantarum, an unfortunate feature which might easily have been avoided. The species of each genus are arranged alphabetically, as is proper in a check-list. The proof-reading has been carelessly done, and the printing is not of the best; yet, with all its faults, the pamphlet is worth the price charged for it (\$1.00), and will serve a good purpose.

THE DE CANDOLLE PRIZE.—The Physical and Natural History Society of Geneva offers a prize of five hundred francs for the best monograph of a genus or family of plants. The manuscript may be written in Latin, French, German, English or Italian, and should be sent to M. le Président de la Société de Physique et d'Histoire Naturelle de Genève, à l'Athénée, Genève, Switzerland.—*Gardner's Chronicle*.

THE DRYING OF WHEAT.—Experiments were made in 1884 at the New York Agricultural Experiment Station upon the loss of water by wheat in drying. In the first case Clawson wheat, har-

vested July 16 and threshed July 18, contained 27.02 per cent of water, of which there were lost by evaporation the following percentages, viz :

July 27	loss 13.80 per cent.	Sept. 14.....	loss 20.33 per cent.
Aug. 3.....	" 17.33 " "	" 21.....	" 20.39 " "
" 10.....	" 18.59 " "	" 28.....	" 19.54 " "
" 17.....	" 19.58 " "	Oct. 5.....	" 18.97 " "
" 24.....	" 20.62 " "	" 12.....	" 19.48 " "
" 31.....	" 19.97 " "	Nov. 22.....	" 24.06 " "

In the second case samples were taken from the bin on September 4, with the following results, viz :

Sept. 14.....	loss 2.77 per cent.	Oct. 5.....	loss 1.57 per cent.
" 21.....	" 3.12 " "	" 12.....	" 2.18 " "
" 28.....	" 2.15 " "	Nov. 22.....	" 8.12 " "

In both cases the samples were exposed to the natural air of the laboratory until October 12, after that date, to November 22, the air was warmed by steam pipes.

The amount of water in wheat in the bin taken at different dates, from the interior of a mass of several hundred bushels, was as follows, viz :

September 22.....	11.96 per cent of water.
October 13.....	16.57 " " "
" 23.....	14.62 " " "
November 1.....	14.17 " " "
" 12.....	14.87 " " "

THE STUDY OF PLANTS IN WINTER.—The old-fashioned text-books tell us to begin the study of plants in the spring, and the custom still in most colleges is to confine the study to the spring and early autumn months. Winter usually stops all work except in the laboratories when "pickled" specimens are dried and examined microscopically. Perhaps in a few cases the green-house may supply unseasonable specimens for class or laboratory study ; but this is not the study of plants in winter that we refer to. All our perennials have winter states which are full of interest to the student. The writer of this note has taken classes of young people, who knew nothing of botany, and set them at work in mid-winter studying the out-of-door vegetation, with nothing but their eyes, pocket-knives, pencils and note-books in the way of apparatus and helps. The structure, position and functions of buds, the structure of twigs and branches, including wood, bark and pith, the structure of the fruits and seeds, of various trees and shrubs, were taken up in succession, with constantly increasing interest. No text-book was used, the pupil depending upon his own resources entirely. By the time that spring came with its bursting buds, its leaves and its flowers, these trained young eyes were eager for their study.

THE BOTANICAL VALUE OF AGRICULTURAL EXPERIMENTS.—That many of the so-called agricultural experiments should have a

high botanical value is evident to every scientific man, but it is a melancholy fact, which does not speak well for the accuracy of the experimenters, that very little of their work has been of use in scientific botany. In the experiments recorded in the third annual report of the New York Agricultural Experiment Station, we have a notable exception to the rule. Many of the results obtained have a high value to the physiological and pathological botanist. Thus we find such topics as the following, viz: The hygroscopic properties of grains; Hybrid barley; Germinations of commercial seeds; The cross-fertilization of maize; A classification of maize, with a description of the species and varieties (with plates); A classification of the agricultural species of garden peas; The size and distribution of roots of various plants determined by washing away the soil; A classification of barley and oats; Report of the botanist upon diseases of the pear, apple, quince, peach, tomato, oats, clematis and Canada thistle. Topics like these, treated as these are, command the respect of scientific men. We hope to see the time when such will be the rule, and not as now the exception.

We hold that every agricultural experiment which has to do with plants must be sufficiently accurate to commend itself to the scientific man, in order that it may be of any permanent value to agriculture. Such an experiment which has no botanical value cannot have a permanent agricultural value. The demands of scientific botany are in no wise more exacting than those of scientific agriculture.

FERTILIZATION OF *TEUCRIUM CANADENSE*.—Of interest to American botanists is the proterandry of the American germander, simulating that of *T. scorodonia* of Europe. The corolla here is not bilabiate as usual in this family, but the tube is split open above as far as the calyx and the five lobes are arranged on one—lower—lip. In the bud the lowest or middle lobe turns up over the stamens and style, serving as a protection to them. This lobe is embraced by the two lobes on either side, and these in turn by the two upper lobes, which usually form the upper lip in the Labiatae. In their first state, as in almost all flowers of this family, the stamens are curved forwards so as to come into more ready contact with the body of the entering insect, in this case usually a bee. The stigma is bent forwards like the stamens, but the stigma lobes having not yet opened, cannot be fertilized. Later the stamens bend far backwards, and since there is no upper lip to check this motion they actually recurve at times. The style in the meantime retains its position or takes a slightly higher position, while its stigma lobes open. The stamens themselves may be short and these are usually of almost equal length, or one or more of them may continue growth and even equal the style in length. There is no regularity, how-

ever, in their unequal development, but if the visits of bees should become less frequent, this variation would offer a means of self-fertilization, and would soon become fixed in all individuals of the species. The proterandry in this species is not perfect. The stigmas sometimes mature, I might almost say, precociously, and the stamens in turn often contain good pollen when the stigma lobes open. Again, the visits of bees seem to be less frequent in this part of the country than is usual with cross-fertilized Labiatae, so I suspect that even the casual irregular growth of the stamens, is in some way correlated with this fact.—*Aug. F. Foerste, Granville, Ohio.*

SPECIMENS OF CUSCUTA WANTED.—Dried or alcoholic specimens of various species of *Cuscuta* are wanted by the subscriber. Any one having good specimens in flower or fruit for sale or exchange will confer a favor by communicating with Charles E. Bessey, Lincoln, Neb.

BOTANICAL NEWS.—Among the topics discussed at the International Congress of Botany and Horticulture, held at Antwerp (Belgium), August 1 to 10, were the following, viz: The rôle of the laboratory in modern science; Instruction in cryptogamic botany; Instruction in vegetable pathology; On the monographing of large genera; The rôle and organization of botanical laboratories; Labeling in botanic gardens, public parks, private gardens and conservatories; The progress of botany (mainly in the schools) since the Congress of 1878; Instruction in vegetable physiology. The papers are published in a thick pamphlet of over 400 pages.—The September Journal of the Linnean Society contains: Supplementary notes on Restiaceae, by Dr. M. T. Masters; Observations on continuity of protoplasm, by S. Le M. Moore; On Rosanoff's crystals in the endosperm-cells of *Manihot glaziovii*, by S. Le M. Moore; On venation and the methods of development of foliage as protection against radiation, by Geo. Henslow.—E. A. Rau contributes a short list of Kansas mosses to the fourth bulletin of the Washburn College Laboratory of Natural History.—Bertrand continues his paper on *Phylloglossum* in late numbers of *Archives Botaniques du Nord de la France*.—The thirty-eighth report of the New York State Museum of Natural History appears much earlier than usual, greatly to its advantage and usefulness. The report of the botanist contains descriptions of many species of fungi. The New York species of *Lactarius* and *Pluteus* are arranged and described. Every botanist will welcome the early appearance of this report. May the vexatious delays of former years not occur again.—Limpricht's Laubmoose (mosses), which will constitute Vol. IV of the new edition of Rabenhorst's *Kryptogamenflora*, is announced by the publisher, Ed. Kummer, of Leipzig.—Dr. Havard's report on the flora of Western and Southern Texas, in the Pro-

ceedings of the U. S. National Museum, is a valuable contribution to our knowledge of the flora of the Southwest.—In a twenty-four page pamphlet, reprinted from Studies in the Biological Laboratory of the Johns Hopkins University, Dr. William Trelease records his observations on several Zoöglææ and related forms. The following new species are described and figured, viz: *Bacterium candidum*, *B. aurantiacum*, *B. luteum*, *B. chlorinum*, *B. incarnatum*. A valuable feature of the work recorded is its biological character. One lays down the pamphlet with the feeling that much work can be done upon the basis of Dr. Trelease's observations. This record is an incentive to further study.—Dr. Trelease's inaugural address, delivered upon his accession to the directorship of the Henry Shaw School of Botany, in St. Louis, November 6, is an admirable presentation of the claims of botany to a place in general education.—The January *Botanical Gazette* will contain a portrait and biographical sketch of Dr. Asa Gray, together with some of the poems, congratulatory addresses, etc., which were sent on his birthday, November 18, 1885.

ENTOMOLOGY.

RECENT DISCOVERY OF CARBONIFEROUS INSECTS.—A rich deposit of Carboniferous insects has been discovered at Commentry, in the department of Allier, France, and has been worked up by C. Brongniart, whose work, however, has not yet been received. From a notice of his paper in the *Entomologische Nachrichten* for November last, we learn that over 1300 specimens of insect remains, not wings alone but also the bodies, have been preserved to science.

While an exclusive study of the shape and venation of the wings must necessarily have led to many errors, the discoveries at Commentry show that insects which are regarded as among the most ancient are still surprisingly like those of the present time, and only differ in comparatively unimportant respects.

In the oldest strata, the Silurian, has been found but a single winged insect, the still very problematical *Palæoblattina douvillei* Brong.; in the Devonian only the six species of insects, as to whose relations excellent naturalists, such as S. H. Scudder and H. Hagen, have very different views, and relative to which discussion has not yet closed. Before the present discovery only 120 specimens of Palæozoic insects were known.

From the Carboniferous formation of Commentry Brongniart has obtained over 1300 examples. Among them occurs the first fossil Thysanuran, represented by forty-five specimens. It differs from existing forms only by having a single caudal filament, and exclusive of this is 15 to 22^{mm.} long, and is generally similar to *Machilis*; it is named *Dasyleptus lucasi*. Numerous representatives of our recent Acridians are brought together under the